INDUSTRIAL HYGIENE INFORMATION AND REGULATORY ACTIONS SUMMARY

December 2004

REGULATORY ACTIONS

OSHA Issues Final Rule on Standards Improvement Process

OSHA published a final rule in the January 5, 2005 Federal Register on the second phase of its standards improvement project. The project addresses inconsistent, duplicative or outdated provisions in OSHA's safety and health standards for general industry, maritime and construction. The rules will become effective March 5, 2005.

"These changes will reduce the regulatory burdens on employers while maintaining the safety and health protections afforded to employees," said OSHA Administrator John Henshaw. "These burdens produce no safety and health value and once eliminated will reduce annual costs by more than $6.8 million."

The final rule revises or eliminates medical provisions in older standards that were once considered accepted practice, but have since been deemed obsolete or unnecessary in current medical practice. For example, annual rather than semi-annual medical examinations will now be required for long-term employees exposed to inorganic arsenic, coke oven emissions, and vinyl chloride.

In addition, the final rule eliminates reporting requirements that have failed to benefit employee health. For example, employers will no longer have to notify OSHA of all workplace releases for certain specified carcinogens. In addition, while employers are still required to establish regulated work areas for vinyl chloride, inorganic arsenic, acrylonitrile, and for the 13 known occupational carcinogens, they will no longer be required to notify OSHA each time they do so.

The final rule updates chemical exposure provisions by making them consistent in terms of the frequency of monitoring and the manner of employee notification of monitoring results. View the rule on the OSHA web site at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=FEDERAL_REGISTER&p_id=18294.

New Youth Employment Rules

On December 16, 2004, the U.S. Department of Labor published final regulations in the Federal Register changing some employment rules for youth ages 14-17. The rules become effective February 14, 2005. The changes include:

- Incorporating into regulations a 1996 amendment to the Fair Labor Standards Act (FLSA) permitting 16- and 17-year olds to load, but not operate or unload scrap

paper baling and compacting equipment, and expanding the previous regulation to include machines that compact non-paper materials, such as metals and plastics.

- Incorporating into regulations a 1998 amendment to the FLSA outlining conditions and criteria under which 17-year olds may drive automobiles and trucks on public roadways on the job. The regulation also prohibits those under 17 years of age from driving automobiles and trucks on public roadways on the job.
- Modifying the regulation regarding the types of cooking and cooking-related duties that 14- and 15-year olds may perform, including provisions limiting the equipment that 14- and 15-year olds can work with and specifying allowable surface temperatures of equipment and liquids.
- Modifying the regulation that prohibits 16- and 17-year olds from roofing occupations to include all work on or about roofs.

Publication of this rule is part of the Department of Labor's ongoing efforts to promote positive, safe work experiences for youth, while ensuring necessary and effective safety protections. As part of this ongoing rule, the Department of Labor contracted with NIOSH to review available data and make recommendations for changes to regulations that prohibit 16- and 17-year olds from performing especially hazardous work. NIOSH provided DOL with these recommendations in 2002: http://www.cdc.gov/niosh/docs/NIOSHRecsDOLHaz/.

LEGISLATIVE ACTIONS OF INTEREST

Chao will Remain Labor Secretary

According to White House press secretary Scott McClellan, Bush has spoken with all four secretaries; Elaine L. Chao, Labor; Norman Y. Mineta, Transportation; Gale Norton, Interior; and Alphonso Jackson, Housing, to secure their decisions to remain in the cabinet.

Henshaw Announces Departure, Leaves Strong Safety Record

John L. Henshaw left OSHA on Dec. 31 after serving more than three years as the agency's administrator. Labor Secretary Elaine L. Chao stated, "Under his leadership, workplace fatalities have declined to record lows, and fatalities among Hispanic workers, which had been increasing since 1995, have been reduced by nearly 12 percent since 2001."

During his administration, OSHA has pursued a vigorous program of firm and fair enforcement, according to an agency press release. It also stated that he combined his efforts with outreach, education and compliance assistance to reduce the number fatalities, injuries and illnesses in workplace covered by the OSH Act.

OSHA officials said that the agency has consistently exceeded inspection goals, and created hundreds of alliances and partnerships with business, labor and community groups to foster safety and health.

"Because of these efforts, there are now more than 1100 sites in OSHA's Voluntary Protection Program, more than 200 Strategic Partnerships Programs sites and nearly 200 alliances," according to OSHA figures. More than 350 of these cooperative programs involve unions, which is an all time high.

Before his appointment, Henshaw had more than 26 years' experience directing environmental, safety and health programs in the chemical industry, and had served as president of the American Industrial Hygiene Association, and as a bioenvironmental engineer in the Air National Guard.

OSHA ACTIVITIES

OSHA Offers Best Practices for Hospitals Receiving Victims of Mass Casualties

OSHA recently released information to help hospitals safeguard their own employees as they care for patients injured in incidents involving chemical, biological or radiological materials. "Drawn from excellent emergency plans developed by hospitals across the U.S., OSHA's new best practices document will support healthcare facilities in protecting their own personnel while they prepare to receive and treat victims exposed to hazardous substances," said OSHA Administrator John Henshaw.

Entitled OSHA Best Practices for Hospital-Based First Receivers of Victims from Mass Casualty Incidents Involving the Release of Hazardous Substances, the document offers useful information to help hospitals create emergency plans based on worst-case scenarios. It focuses on suggestions for appropriate training and suitable personal protective equipment for healthcare employees who may be exposed to hazardous substances when they treat victims of mass casualties. The document includes appendices with practical examples of decontamination procedures and medical monitoring for first receivers who respond to a mass casualty incident.

To develop the guidance, OSHA drew upon the best practices of hospitals of varying sizes and with differing risk levels and conducted an extensive literature search. The agency also placed a draft on its Web site during August 2004 and solicited additional stakeholder input.

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) requires hospitals to develop plans to respond to both natural and manmade emergencies. Depending on their roles, some hospital employees also may be covered by OSHA's hazardous waste operations and emergency response standard. Following the guidance in the document will enable hospitals to fulfill these responsibilities.

OSHA's best practices document for first receivers is available on the Emergency Preparedness and Response Web page at http://www.osha.gov/dts/osta/bestpractices/firstreceivers_hospital.html.

Revision of the OSHA "$AFETY PAYS" E-Tool for Employers

OSHA and NIOSH are updating and enhancing *$AFETY PAYS*, an OSHA developed interactive software program for measuring the economic impact of occupational injuries and illnesses on a company's profitability. The program uses a company's profit margin, average costs of an occupational injury or illness and an indirect cost multiplier to project the amount of sales a company would need to generate in order to cover the cost. Enhancements to the program include customizing the program to fit a firm's ability in capturing their costs. Contact Elyce Biddle at EBiddle@cdc.gov for more information.

New Worker Guidelines for Use During National Emergency Incidents

OSHA announced its support for the National Response Plan (NRP) by the Department of Homeland Security (DHS), which includes a new *Worker Safety and Health Annex*. The Annex provides guidelines for implementing worker safety and health support functions during national incidents, including acts of terrorism, major natural disasters, or man-made emergencies.

"The Worker Safety and Health Annex is an important contribution to emergency management," said Acting OSHA Administrator Jonathan L. Snare. "It provides direction for the coordination and process by which responder safety and health will be conducted and it can serve as a template for state and local response organizations to follow."

The Annex is designed to provide a consistent high level of protection for all organizations involved in nationally significant events. Proper management of responder safety and health could be beyond any one organization's capabilities due to the vast number of people who are involved in major disasters. The Worker Safety and Health Annex provides for the coordination of Federal safety and health assets for proactive consideration of all potential hazards; ensures availability and management of all safety resources needed by responders; shares responder safety-related information; and coordinates among Federal agencies, State, local, and tribal governments, and private-sector organizations involved in responses to nationally significant events.

The Department of Homeland Security's NRP establishes a unified and standardized approach within the United States for protecting citizens and managing homeland security incidents. The NRP standardizes Federal incident response actions by integrating existing and formerly disparate processes and establishes standardized training, organization, and communications procedures through the National Incident Management System (NIMS), and clearly identifies authority and leadership responsibilities. It establishes protocols to help

- Save lives and protect the health and safety of the public, responders, and recovery workers;
- Ensure security of the homeland;
- Prevent an imminent incident, including acts of terrorism, from occurring;

- Protect and restore critical infrastructure and key resources;
- Conduct law enforcement investigations to resolve the incident, apprehend the perpetrators, and collect and preserve evidence for prosecution and/or attribution;
- Protect property and mitigate damages and impacts to individuals, communities, and the environment; and
- Facilitate recovery of individuals, families, businesses, governments, and the environment.

The full National Response Plan and Appendices are available from the DHHS web site at http://www.dhs.gov/dhspublic/interapp/editorial/editorial_0566.xml.

NIOSH ACTIVITIES

Government Nanotechnology Strategic Plan Notes Key NIOSH Role

NIOSH's key role in conducting and partnering in research on occupational exposures to nanomaterials is noted in a new strategic plan under the National Nanotechnology Initiative, the interagency consortium overseeing the federal government's widespread nanotechnology activities. The *National Nanotechnology Initiative Strategic Plan: December 2004* charts the vision, goals, and plans by which NIOSH and partner agencies will work to expedite the responsible advancement of nanotechnology over the next 5 to 10 years, and to ensure that the U.S. will remain a world leader in nanotechnology research and development.

NIOSH is advancing research to better understand the ways in which people may be exposed to nanoparticles in the production and use of nanomaterials, and whether those exposures may result in health effects. In the interim, as the new strategic plan notes, NIOSH plans to issue recommendations in 2005 on "safe working practices when producing and handling nanoscale materials." The strategic plan is available at http://www.nano.gov/NNI_Strategic_Plan_2004.pdf. More information on NIOSH's research program is available at http://www.cdc.gov/niosh/topics/nanotech.

NIOSH Standards Development Process Presented

Employees from the NIOSH National Personal Protective Technology Laboratory (NPPTL) participated in the 12th International Conference of the International Society of Respiratory Protection (ISRP) held in Yokohama, Japan on November 8-12. The conference, Respiratory Protection of Workers and Citizens, was organized by the Asian Section of the ISRP. NPPTL Director Rich Metzler presented the keynote address on chemical, biological, radiological and nuclear (CBRN) respirator standards development in the U.S. highlighting the NIOSH process for developing standards for powered air purifying respirators, self-contained breathing apparatus, self-contained escape respirators and air-purifying escape respirators. Bill Newcomb discussed total inward leakage and summarized the assigned protector factors proposed by the Occupational Safety and Health Administration. Ziqing Zhuang described facial anthropometrics and John Kovac presented standards concepts for respirators and breathing apparatus used

to protect emergency responders. During the conference, Rich Metzler, former ISRP President, received the Revoir Award for his contributions to the society.

NIOSH Researches the Human Cough

NIOSH researchers are developing an innovative cough recording machine. They are conducting tests to determine whether the computerized device will detect work related lung disorders by recognizing differences in human coughs.

When someone coughs into the machine, the sound pressure wave and airflow patterns are recorded. Based on these measurements, several cough parameters are calculated and the difference between parameters of normal subjects and subjects with lung disorders are used to train a computerized system called a neural network classifier. The trained classifier can then be used to distinguish between newly tested normal subjects and subjects with lung disease. The system is currently scheduled to be evaluated as a new method for detecting lung disease in the workplace. For further information on this ongoing research, contact Jeremy Day, NIOSH Health Effects Laboratory Division, at JDay2@cdc.gov.

Economic Impact of Occupational Injury and Illness

With funding from NIOSH, the Center to Protect Workers' Rights is addressing gaps in describing and measuring the economic costs resulting from occupational injuries and illnesses. This project seeks to quantify those costs and the burden on construction workers and their families, specifically looking at those costs not typically addressed in existing approaches. Researchers will also determine who estimates and actually pays the cost of these injuries and illnesses among construction workers.

NIOSH and ASSE Extend Partnership

On December 17, 2004, NIOSH and the American Society of Safety Engineers (ASSE) signed an agreement extending their formal partnership to improve workplace safety and health in the U.S. Their original agreement, signed October 23, 2003, established a one-year formal partnership. This new agreement extends the partnership for an additional three years, and calls on NIOSH and ASSE to partner in:

- Developing and disseminating information on worker safety and health at appropriate conferences and through multiple media, including the NIOSH and ASSE websites;
- Participating at conferences, meetings and other key events where occupational safety and health issues are addressed;
- Including the safety sciences in the advancement of occupational injury and illness prevention research and practice;
- Promoting academic and professional development opportunities in safety to help advance leadership in safety education and research;
- Advancing the effectiveness of occupational safety and health research; and
- Promoting and facilitating the transfer and workplace implementation of research results on effective occupational injury prevention strategies and technologies.

More information on this agreement can be found at:
http://www.cdc.gov/niosh/updates/upd-12-17-04.html.

EPA ACTIVITIES

Environmentally Responsible Computer Disposal in the Federal Government

EPA has awarded its first contracts to help all federal agencies in the environmentally responsible disposal of computers and other used electronic equipment. Called Government Wide Acquisition Contracts (GWACs) for Recycling Electronics and Asset Disposition (READ) services, they provide federal agencies with a dependable method of properly recycling and disposing of excess or obsolete electronic equipment.

The U.S. Government buys seven percent of the world's computers. In fiscal year 2005 alone, EPA expects federal agencies to spend almost $60 billion on Information Technology equipment, software, infrastructure and services. The Government disposes of approximately 10,000 computers every week, a significant number of which are ending up in storage closets, warehouses and landfills, or overseas where generally the environmental standards are lower. Electronic equipment contains toxic materials such as lead, mercury, chromium, cadmium, and beryllium, which, if mishandled, could be released into the environment. This complex waste stream poses challenging management issues and potential liability concerns for federal facilities.

The GWAC is composed of eight contracts (three nationwide, three in the eastern U.S. and two in western U.S.) awarded to small businesses. The basic contracts approved December 16 run for one year with up to four possible one-year extensions, with a combined potential value of up to $9 million. Contractors must maintain an audit trail to the equipment's final destination to ensure that reclamation and recycling efforts are documented. The contracts will also maximize revenues from usable electronic equipment currently in storage through a share-in-savings (SiS) program. Under SiS, the contractor will attempt to identify opportunities to save costs associated with recycling efforts and share those savings with federal agencies to offset the latter's recycling costs.

For more information on the READ program, go to:
http://www.epa.gov/oamhpod1/admin_placement/0300115/fact.htm.

In a related issue encompassing all parts of American society, not just the federal government, EPA is also working to increase the number of consumer electronic devices collected and safely recycled in the United States under a program called "Plug-In To eCycling." Plug-In is one component of EPA's Resource Conservation Challenge, a national effort to find flexible, yet more protective ways to conserve our valuable resources. More information on "Plug-In To eCycling" is available at:
http://www.epa.gov/epaoswer/osw/conserve/plugin/index.htm.

EPA Announces Final Designations for First Fine Particle Standard

Twenty governors were told by the EPA that certain areas of their states do not meet the nation's first fine particle (PM2.5) air quality standards. While the great majority of the nation's counties meet the new health-based standards, all or part of 224 counties nationwide, as well as the District of Columbia, are not in attainment with the standards.

"The good news for 30 states is that they already meet the fine particle standards," Administrator Mike Leavitt said, "The good news for the remaining areas of the country is that we have new rules both proposed and in place to help these states make their air cleaner to breathe."

Thirty states and their 2,909 counties received the good news that they meet PM2.5 air quality standards. These states will need to continue their progress by sustaining clean air. "*The Particle Pollution Report: Current Understanding of Air Quality and Emissions through 2003*," reported that 2003 PM levels were the lowest since monitoring began.

The reduction of fine particle pollution is a critical element of the Bush Administration's comprehensive national clean air strategy - a strategy that makes clean air and clean energy a centerpiece of public health protection and a vital economy. This strategy includes Clear Skies legislation, the Clean Air Interstate Rule, and the Administration's recent rule to reduce pollution from non-road diesel engines. These rules are important components of EPA's efforts to help states and localities meet the protective national fine particle and 8-hour ozone air quality standards. Together these rules will help all areas of the country achieve cleaner air.

PM2.5 – approximately 1/30th the size of an average human hair – can aggravate heart and lung diseases and has been associated with a variety of serious health problems including heart attacks, chronic bronchitis and asthma attacks. This action officially notifies states that they need to do more to reduce fine particle pollution in order to protect human health.

Meeting these standards will prevent at least: 15,000 premature deaths; 75,000 cases of chronic bronchitis; 10,000 hospital admissions for respiratory and cardiovascular disease; hundreds of thousands of occurrences of aggravated asthma; and 3.1 million days when people miss work because they are suffering from symptoms related to particle pollution exposure.

States with non-attainment areas must submit plans by early 2008 that outline how they will meet the PM2.5 standards. They are expected to attain clean air as soon as possible and not later than 2010. EPA can grant one five-year extension for areas with more severe problems. The attainment date for those areas would be 2015.

To develop these final designations, EPA requested recommendations from state governors and tribal leaders on the appropriate boundaries for non-attainment areas. EPA carefully reviewed the state and tribal recommendations and revised them in June 2004 - adding more than 100 counties that EPA believed contributed to air quality violations. The Agency then provided the opportunity for state and tribal

representatives to respond. EPA's recommendations included counties where monitors show violations of the PM2.5 standards and surrounding counties that contribute to those violations.

For more information on the particle pollution, visit: http://www.epa.gov/pmdesignations/.

For more information on the 2004 Clean Air rules, visit: http://www.epa.gov/cleanair2004.

For more information on particulate matter trends and the noted report on 2003 Particle Pollution, visit: http://www.epa.gov/airtrends.

EPA/NIST Study of Ventilation and Indoor Environmental Quality

A National Institute of Standards and Technology (NIST) analysis of a recent EPA survey of 100 representative U.S. public and commercial buildings found that actual post-construction ventilation conditions are often different than expected based on the building design. This analysis was part of the U.S. EPA Building Assessment Survey and Evaluation (BASE) study to define the status of existing U.S. buildings with respect to indoor air quality, ventilation and occupant perceptions of environmental conditions.

The analyses showed frequent instances of "under-ventilation," which can cause poor air quality, occupant discomfort, and even illness. It also found instances of "over-ventilation," a situation that can boost energy costs significantly. The NIST report stated that such findings highlight the importance of early testing of a ventilation system's ability to achieve design intent.

The differences between the actual versus predicted ventilation rates also highlight the need for regular maintenance checks. NIST researchers, however, noted instances when building engineers could not find the ventilation system plans and when the ventilation system equipment was inaccessible. They urged building designers and operators to remedy those situations.

NIST's analysis and the original data should be useful for establishing standardized protocols for future indoor air quality studies, examining the relationship between symptoms reported by occupants and building characteristics, and developing guidance on building design, construction, operation and maintenance.

This study is available at http://www.bfrl.nist.gov/pdf/BASE-final.pdf

TECHNICAL ARTICLES OF INTEREST

Regional Comparison of Mold Spore Concentrations

Citation: "*A Regional Comparison of Mold Spore Concentrations Outdoors and Inside "Clean" and "Mold Contaminated" Southern California Buildings*", D. Baxter, J. Perkins, C. McGhee, J. Seltzer, Journal of Occupational and Environmental Hygiene, 2005, 2:1, p 8 - 18, http://ujoeh.metapress.com/link.asp?id=tde46g8uxflrm3br

Abstract: "A total of 625 buildings and outdoor locations in the San Diego, California, area were monitored using the Allergenco Sampl-Air MK-3 impaction sampler or the Zefon Air-O-Cell slit bioaerosol cassette. Locations were classified by rigid criteria as clean commercial, commercial with mold growth, clean residential, residential with water staining and residential with mold growth. In addition, coastal and inland outdoor locations were measured. Seven categories (total spores, Ascospores/Basidiospores, *Cladosporium*, Smut/Myxomycetes-like, *Aspergillus/Penicillium* (AS/PE), *Alternaria*, and Unidentified/Other) were detected frequently enough that maximum likelihood estimate techniques could be used to determine distribution parameters and, thus, treat these as continuous variables. For total counts (no nondetectables) an analysis of variance was used to examine differences in location means. For the other categories Land's confidence limits were generated and visually compared for differences among locations. For 12 other categories (*Curvularia*, *Dreschlera*, *Epicoccum*, *Fusarium*, Mildew-like, *Pithomyces*, Rusts, *Stachybotrys*, *Stemphyllium*, *Torula*, *Ulocladium*, and Zygomycetes-like), detection generally occurred in less than 10 percent of samples. These genera were treated as dichotomous (detect/non-detect) data, and Chi-square analyses differentiated between locations. For total counts, values were significantly different on the order of clean < outdoor < moldy. There was a large difference between the moldy and other location classes. For AS/PE, moldy location means were clearly higher than those for clean buildings and outdoors, although the clean and outdoor means could not be differentiated. For all other genera the results tend to indicate little or no ability to discriminate location. For example, there were no differences in the probabilities of detecting *Stachybotrys* among the various locations. In our study only total counts, usually driven by AS/PE concentrations, had value in determining whether a building is mold contaminated employing our set of rigorous location classification criteria."

Background: The most common application of slit impaction samplers in air quality investigations is to help decide whether fungal concentrations in the indoor environment are "normal" or "atypical" and to decide when the remediation of mold-contaminated environments has been satisfactorily completed. In spite of this procedure's widespread use, very few comparative studies have been published regarding the expected range of mold spores in "clean" buildings, buildings with evidence of fungal growth, and regional outdoor concentrations as determined by this sampling procedure. Sampling approaches, as well as the statistical approaches used to declare a building clean or contaminated, vary significantly among investigators. In the absence of standardized analysis methods, laboratory analysis and data reporting procedures are also highly variable. Investigators often rely on general comparisons of limited indoor sampling with limited samples from the local outdoor air without considering the regional variability (geographic, microclimatic, diurnal, and seasonal variability). Consequently, considerable variability both in the analytical results and their interpretation is common.

The majority of current regional outdoor data has been obtained using the Burkard 7-day. The majority of this data is collected from the rooftops of multi-story buildings

and over long time intervals (*i.e.*, 5–7 days). In contrast, the majority of the data collected for the evaluation of buildings (indoors and outdoors) is based on short-term impaction samplers like those noted earlier. These devices are frequently used to collect 5- to 10-minute samples at entry and exit points or fresh air intakes and supply locations of heating and air-conditioning systems.

The purpose of this study was to analyze short-term mold spore data collected from well-characterized residential and commercial buildings that have been classified based on predetermined visual inspection criteria. These results are compared with outdoor sampling results that have also been collected on a short-term basis at entry and exit points to buildings, including primarily ground level outdoor sampling that is more typically performed during routine indoor air quality investigations.

Methods: The data presented in this study were collected in Southern California and analyzed by Environmental Analysis Associates (EAA) between 1994 and 2001. Although EAA has evaluated several thousand buildings and residences over this time period, this study included only buildings where a comprehensive building history and complete visual inspection information could be obtained. Since water or moisture content is the primary determining factor in indoor mold growth, the study group divided buildings in this study into five classifications based on both visual inspection and the presence or absence of water staining or visible mold growth. Building classifications were:

1. "Clean" commercial office and non-industrial workplace environments.
2. Commercial office and non-industrial workplace environments with evidence of mold growth.
3. "Clean" residential single-family dwellings and apartments.
4. Residential single-family dwellings and apartments with evidence of water staining only. (There were insufficient data collected from commercial buildings with water staining to differentiate them from non-water-stained buildings.)
5. Residential single-family dwellings and apartments with evidence of mold growth.

To classify a building as "clean," it had to satisfy all of the following conditions:

1. No evidence or history of flooding was observed or found based on written records or by verbal communication with the tenant or building owner.
2. No evidence of moisture intrusion determined by our thorough systematic visual inspection.
3. No history of sewer backups.
4. No visible mold growth.
5. No interior surface moisture measurements exceeding 15 percent (equivalent wood scales) using a Delmhorst penetrating moisture meter or Tramex Moisture Encounter non-penetrating moisture meter.

6. Causes other than water intrusion or fungal growth were suspected or identified as the origin of the original air quality complaint.
7. Water staining was observed in no more than two windows. If staining was present, it could only be present on the operational side of the windowsill or in a jamb corner, and no visible mold growth was permitted. This exception was allowed because it is rare to find any building in Southern California with operational windows (commercial or residential) that does not have minor water staining present in at least one or two locations.

In addition to the indoor sampling data, an outdoor regional database consisting of 589 samples collected from over 423 Southern California locations was also included in the study. The outdoor sample database consists of samples collected during the course of routine indoor air quality investigations, as well as investigations specific to mold contamination. The outdoor sample database includes samples collected outside buildings in the study and buildings not included in the study in the same region. All outdoor samples were collected randomly throughout the year from Southern California in San Diego and Imperial counties, and west of the mountain ranges bordering the desert communities. Over 90 percent of samples were collected within San Diego County.

More than 90 percent of outdoor samples were collected at ground floor level outside the front or rear entrances to buildings that were being inspected for indoor air quality problems. The remaining outdoor samples were collected from the rooftops of multistory buildings (20 samples) or at a time-integrated sampling station located 20 feet (1.8 meters) above ground level at EAA (60 samples). Samples collected within 5 miles of the coastline were classified as coastal samples. All other sample locations were classified as inland.

Two slit impaction sampling devices were used in this study: the Allergenco Sampl-Air MK-3 impaction sampler and Zefon Air-O-Cell slit bioaerosol cassette. Both devices have similar slit design characteristics and recommended sampling flow rates. Preliminary side-by-side comparison measurements of outdoor air using two Air-O-Cell samplers and two Allergenco samplers demonstrated similar reproducibility for the two devices. The mean values for three consecutive sets of quadruplicate side-by-side measurements collected over a half-hour period ranged from a low of 1813 spores/m^3 to a high of 3133 spores/m^3. One AirO-Cell sampler was collected facing up, while the other sampler was facing down. Both Allergenco samplers were collected facing up.

Discussion: All data collected in this study are potentially biased in two ways. First, the vast majority of indoor measurements were made in direct response to an alleged indoor air quality complaint. Inspections indicated that some of these complaint buildings were clean. This clean group became the control group for this study. Ideally, non-complaint buildings chosen at random would have constituted a better population for the clean group. Second, building classifications have not been subdivided beyond identifying them as commercial or residential. For example, a one-room school building relying on a combination of window ventilation and window HVAC

is not separated from a high-rise office building relying on HVAC systems for 100 percent of fresh air exchange. Thus, differences in commercial and residential buildings could be obscured by inadequate detail in classification.

Residential buildings that have pets have not been differentiated from homes without pets, nor were apartment units differentiated from single-family residences. These factors likely widen the distribution of airborne mold spore concentrations for any given building type and decrease the power to find differences between building types. Ideally, larger sample sizes would have allowed further sub-classifications that might have yielded statistically meaningful differences.

The outdoor concentration and distribution of mold spores are known to vary greatly on a seasonal, daily, and even hourly basis depending on changing meteorological conditions. Based on information generated by the National Allergy Bureau of the American Academy of Allergy, Asthma, and Immunology, as well as local outdoor data collected by EAA, the range of concentrations in any individual location can vary more than a hundredfold. For example, total mold spore concentrations at EAA's outdoor monitoring station in San Diego have ranged from 200 spores/m^3 during calm wind conditions to 80,000 spores/m^3 during high Santa Ana wind conditions (wind speeds greater than 20 miles per hour). The most predominant fungal groups found outdoors include ascospore/basidiospore and *Cladosporium* species.

Occasionally, elevated concentrations of other fungal groups, including *Aspergillus/Penicillium*, *Alternaria*, and smuts/myxomycetes, could also be found. Even with this variability, the large number of outdoor samples collected for this study allowed the mean outdoor total count to be differentiated from mean total building counts in the rank order of clean < outdoor < moldy.

ACGIH recommends using two sources of comparison data as a guide for acceptable mold spore concentrations in buildings: (1) a clean building control group, and (2) regional outdoor mold spore concentrations. Any comparison with outdoor data should consider the climatic variation of the region. All comparisons of data should utilize the calculated confidence limits of the means and not just the mean values.

It would seem unreasonable to set an acceptability limit for the concentration in a building equal to a clean building mean or its upper confidence limit (calculated from many samples as in this study), as too many "clean" buildings would erroneously be categorized as "moldy." Such a criterion is too stringent. Conversely, setting a guideline at the 90th or 95th percentile, as recommended by ACGIH, might include too many contaminated buildings in the "acceptable" category. Using an ACGIH criterion for acceptability of less than the 90th percentile of clean buildings, it is clear that approximately 20 – 40 percent of the moldy buildings in our study would have been mis-categorized as "acceptable" based on the air sampling data alone.

Conclusions: Currently, there is a lack of carefully conducted studies that systematically evaluate buildings and statistically analyze visual and laboratory data that identify and quantify fungal growth. As a result, investigators often use diverse investigation approaches and take wide liberties in their interpretation of the

environmental significance of airborne fungal spore concentrations. Careful statistical evaluation of our data supports the following conclusions and recommendations:

1. A systematic visual inspection can be an accurate predictor of the level of airborne fungal spore concentrations.
    a. In general, the absence of visible mold growth in readily accessible areas of buildings is an accurate predictor of the absence of elevated fungal spore concentrations. Exceptions are most likely to occur in nonresidential buildings.
    b. The presence of water staining alone in a residential building is more likely to yield sample results similar to clean rather than moldy buildings.
    c. The presence of significant visible fungal growth of more than one square foot total is a good predictor of elevated airborne fungal spore concentrations in that room.
2. Because airborne fungal spore distributions are lognormal, the application of statistical tests based on normally distributed data is inappropriate.
3. This data from Southern California demonstrate typical clean building total mold spore concentrations are less than 4000 spores/m^3 in approximately 90 percent of buildings sampled. While buildings classified as "clean" will occasionally exceed this concentration, total spore concentrations for buildings classified as "moldy" range from approximately 200 to greater than 2,000,000 spores/m^3.
4. When airborne spore concentrations are elevated as a result of indoor fungal amplification, the airborne spores present are usually from a few fungal groups, primarily *Aspergillus* and *Penicillium* genera.
5. For total, *Aspergillus/Penicillium*, and ascospore/ basidiospore concentrations, the least overlap or greatest differentiation between clean and moldy buildings is found at the 25th percentile of moldy buildings and the 75th percentile of clean buildings. These values are approximately equal. There is not a single cut-off value that would completely differentiate clean from moldy buildings without yielding false positive or false negative results. Using the 25th percentile of fungal spore concentrations for moldy buildings in this study provides a reasonable target for confirmation that a building has potential mold problems. If no visible mold growth is present, and the levels exceed the 25th percentile for moldy buildings, further investigation is warranted to evaluate the possibilities of hidden indoor mold growth, outdoor infiltration, and inadequate housekeeping.
6. In general, fungal spores other than *Aspergillus/Penicillium*, ascospore/basidiospore, and *Cladosporium* are found less frequently and in lower concentrations in indoor air, even in the presence of excessive moisture and mold growth. This limits the ability to derive any reliable useful information regarding the analysis of the distribution or ratio of these other fungal groups.

7. Although the data in this study are limited to the identification of fungal spores at genus level or morphological classification, they statistically demonstrate that discriminating between clean and moldy buildings and the outdoor environment is possible without having specific species identification. The relatively small sample size of our study did not permit differentiation of airborne fungal spore concentrations in clean versus moldy buildings for less commonly occurring genera (*e.g.*, *Chaetomium*, *Epicoccum*, *Stachybotrys*). Of note, the sample sizes in our study were larger than are typically used by field investigators to interpret the significance of their own data.

Recommendations: At this time, indoor fungal spore concentrations should be compared with regional data from inside "clean" buildings to establish an upper range suggesting the absence of fungal amplification.

Limited outdoor sampling data is most appropriately used to roughly assess the potential for infiltration from outdoor sources. It should be used cautiously in direct comparisons with contemporaneous indoor data for the determination of indoor amplification.

If outdoor data are used for comparison, sufficient numbers of measurements representing the local microclimate environment are required to establish statistical significance. A confidence limit test (on the mean of outdoor values) should be applied to determine if the indoor environment is contaminated by outdoor sources.

Additionally, these cutoff values could be used to help determine when remediation of fungal growth in a building has been successfully performed. However, other factors, such as the results of a thorough post remediation visual inspection and sampling design, must be considered.

Finally, airborne fungal spore data obtained without adequate sample sizes can be used to suggest classification of "clean" or "moldy" buildings. However, in such cases, conclusions based exclusively on sampling results are subject to a greater likelihood of error. Combining airborne data with a careful systematic visual inspection can minimize erroneous conclusions.

Investigation of a Home with Extremely Elevated Carbon Dioxide Levels

Source: "*Brief Report: Investigation of a Home with Extremely Elevated Carbon Dioxide Levels --- West Virginia, December 2003*", MMWR Weekly Report, December 24, 2004 / 53(50);1181-1182, http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5350a5.htm.

Investigations of indoor air quality complaints typically focus on mold, water damage, ventilation systems, and combustion byproducts and are guided by the nature of the symptoms observed in affected persons. This report documents the investigation of exposures at a home in which the occupants had unusual respiratory and neurologic symptoms.

Case Report and Initial Investigations

In June 2001, a man and a woman, both of whom were smokers, previously healthy, and aged 42 years, moved into a newly built, two-story home. Shortly after moving in, the woman noted episodic shortness of breath, lightheadedness, dizziness, and fatigue while in the finished basement. The man reported episodic mild confusion, poor concentration, headache, and blurry vision while working in the basement. Their symptoms always resolved within minutes of returning upstairs.

The natural gas water-heater pilot light located in the basement recurrently went out; however, gas company and fire department inspections did not reveal gas leaks, methane, or carbon monoxide (CO). In July 2003, the woman went to a hospital emergency department (ED) on two consecutive mornings with shortness of breath, rapid heart rate, and panic. She was admitted and had new asthma diagnosed, as well as a cardiomyopathy (35 percent cardiac ejection fraction) attributed to a 1997 *varicella* infection. However, her basement-related symptoms persisted despite newly prescribed cardiac and respiratory medications.

In October 2003, the man entered a 30- by 70- by 3-foot crawlspace adjacent to the finished basement for a 3-hour period to investigate potential gas leaks. He reported feeling breathless and felt a "strong gush" of air when he opened an access door to the below-grade crawlspace, and later noted hoarseness. In November 2003, the man and a hired contractor became breathless after they entered the crawlspace. That day, another fire department inspection indicated negative readings for CO and methane in the basement. Four hours later, the man went to a hospital ED with rapid respiration and a burning sensation in his eyes. He had a mildly elevated carboxyhemoglobin level (6 percent) and was discharged with a diagnosis of acute CO exposure.

In December 2003, two contractors had onset of hoarseness and rapid heart rate while at the crawlspace entrance. One man reported a metallic taste. The fire department responded and, on arrival, the first firefighter felt a strong draft at the crawlspace entrance that "took his breath away." Levels of CO, methane, and other explosive gases were below limits of detection. The fire department then called the county Hazardous Materials Incident Response Team (HMIRT).

HMIRT found low oxygen (O_2) levels in the basement and called the West Virginia Department of Environmental Protection (WVDEP) to investigate further. The WVDEP field investigator documented O_2 concentrations as low as 14 percent in the crawlspace (normal air: 21 percent). Suspecting that carbon dioxide (CO_2), a colorless and odorless gas, had displaced the oxygen, WVDEP requested technical assistance from NIOSH to measure CO_2 concentrations and, if levels were elevated, to help identify CO_2 sources and recommend control strategies. NIOSH assisted WVDEP with CO_2 sampling, contacted the county and state health departments, and assisted with interviewing the homeowners and reviewing relevant records.

CO_2 Sampling and Monitoring

A direct-reading, high-concentration CO_2 monitor (detection range up to 50 percent CO_2) was used for short-term sampling and continuous monitoring. WVDEP documented CO_2 concentrations as high as 9.5 percent in the basement crawlspace, 11 percent in the crawlspace gravel, and 12 percent in the basement floor drain (normal air: 0.035 percent CO_2). CO_2 levels on the upper floors exceeded the upper limit of detection (1 percent) of a standard CO_2 monitor. CO_2 levels in the soil surrounding the home were as high as 8 percent. Basement CO_2 levels remained elevated, regardless of whether the furnace was operating. The NIOSH Recommended Exposure Limit for CO_2 in workplaces is 0.5 percent (5,000 ppm) for a 40-hour workweek and 3.0 percent for a 15-minute short-term exposure limit; a level of 4.0 percent is designated as "immediately dangerous to life or health.

Carbon isotopic composition analysis of air samples indicated a carbonate source of the excess CO_2 in the home, likely from mining. Mine maps confirmed that the home was built on a reclaimed surface coal mine and that an abandoned deep coal mine lay beneath the property. Renovations to the crawlspace redirected and limited ground CO_2 infiltration into the home. CO_2 concentrations have decreased to a maximum of 0.2 percent measured in the basement; O_2 concentrations have returned to normal, and related symptoms in the homeowners have resolved. Whether any neighboring homes were at risk for elevated CO_2 concentrations was unknown.

The results of this investigation underscore the need for heightened public awareness and special training for emergency response and utility workers, careful environmental measurements to assess potential risks, and precautions to avoid incapacitation and prepare for rescue during immediately dangerous conditions. Building codes that mandate preventive construction, including sealing cracks, maintaining positive pressure within the structure, and subsurface ventilation for new buildings over landfills, caves, and abandoned mines might also be appropriate public health actions.

OTHER ITEMS OF INTEREST

Flu Crisis Exposes Large Gaps in Bioterrorism Readiness

The Chicago Tribune reported that problems producing flu vaccines have highlighted the difficulties facing the U.S. government as it tries to counter bioweapons. The U.S. is substantially ahead of where it was three years ago, experts say, but further progress is urgently needed. The nation's public health network was long neglected. Many state and municipal offices lacked adequate computer and communications technologies. There is still a relative lack of vaccines to prevent outbreaks caused by microbes that experts worry most about and drugs to treat those infected. There is no effective vaccine for some pathogens. It is a problem likely to take years to fix due to lengthy lead times necessary to develop effective vaccines and treatments. The pharmaceutical industry has also not rushed to make the needed products because it is not clear that companies could recoup their costs. A related problem is the lack of a way to quickly

diagnose people infected with the most serious pathogens. And, despite preparedness efforts, a major bioterrorism attack infecting hundreds or thousands would quickly overwhelm health-care providers in most regions. Earlier this year, President Bush enacted Bioshield legislation, aimed at providing billions of dollars in incentives for drug companies to develop products that could protect Americans against bioterrorism attacks. But a recent survey of experts in the field found the government's efforts will not "produce the countermeasures the nation needs for a truly effective biodefense." (CHPPM HIO Weekly Update – December 3, 2004)

New Methods for Making Flu Vaccine

AZCentral.com reported that it currently takes about six months to make flu vaccine. But promising new manufacturing methods are on the horizon, including one using viruses grown in cultured cells from monkeys, dogs or human stem cells, that could significantly speed the vaccine-making process. Researchers caution that perfecting the new techniques of making flu vaccine may take several years. Almost all of today's flu vaccine supply is made by growing influenza viruses in specially cultivated chicken eggs. "It takes hundreds of millions of eggs to produce one year's flu vaccine and clean eggs are not always available year 'round in that quantity," said William Hillegas, the chief investigator for a flu virus-growing study funded by the National Center for Allergy and Infectious Diseases. "Using animal cells to grow the viruses allows you to scale up much more quickly," Hillegas said, "You can grow the flu viruses in these cells on a much larger scale using massive bio-reactors." Hillegas said the cell-culture methodology would allow "100 million or even 200 million doses to be made" in less time that it now takes to make a single batch of egg-cultured vaccine. (CHPPM HIO Weekly Update – December 3, 2004)

Gulf War Report Concludes Link Between Lung Cancer and Combustion Products

The latest phase of a study sponsored by the U.S. Department of Veterans Affairs regarding illnesses associated with the Gulf War is posted on the web. The study was conducted by a committee from the Institute of Medicine (IOM), a private, nonprofit institution that provides health policy advice under a congressional charter to the National Academy of Sciences.

The committee evaluated published, peer-reviewed research on exposure to unburned fuels, combustion products, and hydrazine and nitric acid for evidence of links to specific cancers, neurological effects or other health problems that persist after exposure. It found the available evidence insufficient to determine an association between the majority of health problems that Gulf War veterans might experience and exposures to fuels for military vehicles, propellants in Scud missiles or substances given off by combustion sources such as oil-well fires, exhausts and tent heaters.

The committee concluded, however, that exposures to air pollution, vehicle exhaust and other combustion products are associated with an increased risk of lung cancer. It found some evidence that exposures to combustion products are linked to asthma and cancers of the nose, mouth, throat and bladder, as well as to low birth weight and

premature births in babies whose mothers are exposed while pregnant. The data, however, were weaker in these cases.

Because information on actual exposure levels experienced by individuals – a critical factor when assessing health effects – was limited, the committee could not draw specific conclusions about Gulf War veterans' chances of developing lung cancer or any other health problems as a result of exposures. Systematic monitoring of air contamination from oil-well fires was not conducted in the Persian Gulf region until May 1991. That monitoring did not measure levels of contamination produced by other combustion sources, such as heaters or engines. In addition, data are not available to support comparisons between levels of exposure during the Gulf War and exposures to similar contaminants in other occupational and environmental settings.

This report is the third in a series that examines the health effects of potentially harmful agents to which Gulf War veterans might have been exposed. The first report focused on potential health effects from depleted uranium, pyridostigmine bromide, sarin and vaccines. The second report examined insecticides and solvents.

The full report can be viewed at:
http://books.nap.edu/catalog/11180.html?onpi_newsdoc12202004.

Scientists Test Ricin Vaccine

HealthDayNews reported that researchers will start conducting human clinical trails to test the safety of an experimental vaccine against ricin, the deadly toxin. The researchers received approval from the U.S. Food and Drug Administration to test the genetically engineered protein vaccine RiVax. In this trial, volunteers will be given the vaccine and their blood will then be checked to see if their bodies produce protective antibodies. Those antibodies would then be injected into mice that would be exposed to lethal doses of ricin in order to assess the protective effects of the human antibodies. As little as 500 micrograms of ricin - an amount that would fit on the head of a pin - can kill an adult. View the HealthDayNews article at http://www.healthday.com/view.cfm?id=522617. (CHPPM HIO Weekly Update – December 3, 2004)

How to Get Workers to Wear PPE

Citation: *"PPE: How to Get Workers to Wear It",* by W. Vanderhoof, Occupational Health and Safety, December 2004.

It is a never-ending battle to get workers to wear any type of personal protective equipment. All types of PPE have their advantages and disadvantages, comforts and discomforts. Getting workers to use it is an endless task. This article's information can be used as a guide to increasing the use of practically any type of personal protective equipment--from head protection to feet protection.

A Practical Solution

Review each area and/or task in the plant. Also, review injury and incident reports. Decide the areas and/or tasks for which you need to have a hazard analysis completed.

After doing a hazard analysis of each area and/or task on the list, decide what type of PPE will be worn in certain areas and for certain tasks. Create or revise the safe work procedures incorporating this information. The workers must be trained on these new or revised procedures. This is done through a safety meeting where the workers are told of the PPE requirements by their supervisor. Also included are the reasons why this type of protection is required, citing the information from the hazard analysis.

More than likely, the workers will not be receptive of the requirement to wear this PPE. Or they may forget to wear it or even quietly refuse to wear it. Remember, the supervisors have agreed to encourage and enforce the safe work procedures when they agreed to be in the position of a supervisor.

Sending the Message

Why does it seem to be so hard to institute a requirement to wear certain PPE to protect workers from injury? It may be the workers have not fully accepted their company's philosophy of providing a safe and healthy workplace by incorporating safety into all aspects of the business. The first thing to do is ensure managers and supervisors fully support the safety philosophy and follow all of the requirements of the safety procedures. The next step is to train employees on the safety and health philosophy of the company. Ensure the workers understand there is no job, no production schedule, no customer's request, and no manager's decision more important than the safety and health of the worker.

This is not accomplished in safety meetings or safety training alone. This is accomplished by the worker seeing the managers and supervisors considering the task at hand and making it as safe as possible prior to the worker's doing the task. The workers must believe the effort is genuine.

The Training Component

The employees must be trained on the requirements of the new procedure. The employees must understand why the PPE is required. This can be accomplished by using statistics of the types of actual injuries in the plant or in the same SIC industry, the number of first aid cases, information from incident and injury and near-miss reports, or any combination of the above.

Workers are not interested in the cost of an injury. This equates them to a dollar value but not to the concern for the worker by the supervisor and management.

The next questions to cover are exactly what and exactly where. In this situation, the workers need to know all of the places, tasks, and conditions that require the certain type of PPE. This is where the hazard analysis can be used to show how the decision was made for this type of protection. Include an explanation on the different types of protection afforded by the types of PPE being offered to the workers (e.g., gloves, hard hats, shoes, etc.).

This next step is very simple and almost silly to mention, but make sure that when the procedure and subsequent training is instituted, the specific PPE is in the hands of the

employees. It makes no sense to institute a requirement for PPE and train the workers, then make the workers wait for the PPE they need to make the task or area safe.

Encouragement/Enforcement

The next area to cover is the how of the enforcement, or encouraging the workers to wear the PPE. After the training is complete, the opportunity is present for observation and positive reinforcement by the supervisor.

When the supervisor sees a worker wearing the proper head protection or other PPE, the supervisor says something positive to encourage the worker to continue the effort. Fellow workers contribute by encouraging one another to wear the required PPE. After a while, the employees probably will change their behavior and accept that the PPE is mandated for their own safety and protection.

This process of observation and positive reinforcement will work at a quick pace for some workers and more slowly for others. Some employees may completely, but silently, refuse to wear the required PPE. These employees need to be handled delicately but firmly, and rather quickly. This can be done with a grace period at the beginning of the time after the workers get their PPE, say, 30 days. After this period, the worker is disciplined according to each company's policies. The discipline must be done swiftly and fairly and regardless of person's position in the company.

By following these basic steps, it should be easier to get workers to wear their PPE.

Rocket Fuel Chemical Found In Water and Produce

CNN reported that the government has found traces of a rocket fuel chemical in organic milk in Maryland, green leaf lettuce grown in Arizona and bottled spring water from Texas and California. What's not clear is the significance of the data, collected by the Food and Drug Administration. Sufficient amounts of perchlorate can affect the thyroid, potentially causing delayed development and other problems. But EPA official Kevin Mayer called for calm, saying: "Alarm is not warranted. That is clear." "I think that it is important that EPA and FDA and other agencies come to some resolution about the toxicity of this chemical," Mayer said. The FDA said in a statement that consumers should not change their eating habits in response to the test results. The FDA has hypothesized that perchlorate may get into plants after they are irrigated with perchlorate-containing water or grown in soil that has been previously exposed to the chemical. (CHPPM HIO Weekly Update – December 3, 2004)

Tips for Selecting Ergonomic Chairs for the Workplace

Citation: "*Take your seat*," Ed Metzger, Industrial Safety and Hygiene News, December 2004.

For many people, chairs and stools are merely things to sit on. In the world of safety and health, however, they can be tools for reducing occupational injuries, reducing lost work time and lowering costs.

Seating can affect operating results when workers spend most of their day seated at an assembly line, workstation or bench. Workers who sit in a chair or on a stool that is too

high, too low, too hard or too difficult to adjust are placing fatiguing strain on their back, legs and stomach muscles. They increase the risk of musculoskeletal disorders, which account for more than one-third of work-related injuries in the U.S.

Ergonomic seating, selected to meet personal comfort needs of users, can help reduce this risk. Adjustable ergonomic seating can adapt to individual differences created by height, strength, body style and other factors. An ergonomic chair can support a balanced work posture and easily adjust to posture changes for all individuals who use the chair.

Adaptability is Key

Purchasing personalized seating does not necessarily mean selecting a different chair model for each individual and task. Instead, look for products that are versatile and adaptable to specific needs. Versatility and adaptability can be provided through such features as adjustable seat and backrest controls or through options and accessories like special backrests, seats, controls, armrests and casters/glides. In addition, modular construction can make it easy to interchange parts, upgrade components, add options and "build" chairs to fit specific user and work requirements.

Here are some guidelines to consider when selecting ergonomic seating:

1. Backrest features

   The chair's backrest should provide lumbar support to maintain the back's natural s-curve (low-back support may not be suitable for an individual with irregular spinal curvature). The backrest height and tilt should be adjustable to provide comfort and assure that the lumbar support fits the back.

   Backrests in special sizes can meet special needs. For example, a taller and wider backrest may increase upper back support, while a narrow backrest (eight inches wide) can support the spine and lumbar area while providing upper-torso mobility, allowing a worker good range of motion without backrest restraint.

2. Chair seat

   A chair seat's width and depth need to accommodate the user. The seat pan should be wide enough for the hips and thighs on either side and deep enough (or shallow enough) to allow the user to sit with his or her back against the backrest without reducing circulation to the lower portions of the legs. To aid circulation and increase comfort, the seat pan should have a waterfall front (well-rounded front edge).

   The seat tilt should be adjustable. The seated worker needs to be able to adjust the angle between the seat pan and backrest to maintain even weight distribution and proper torso-to-thigh angle. Ergonomists recommend an angle between 90-105 degrees.

   Seat height adjustability is also needed to work at the proper level and avoid awkward postures. Working at the proper level - rather than to be able to put feet flat on the floor - is the number one reason for adjusting seat height. Seat height mechanisms should be easy to operate and not require the user to leave the sitting

position to make an adjustment. Use a footrest or footring if necessary for foot support.

3. Chair controls

   On many chairs, the only control is for seat height. A chair needs to also offer seat tilt; backrest height and backrest tilt adjustability for full ergonomic benefits. These controls need to be within easy reach of the seated chair user.

   Many chairs of modular construction can be retrofitted with other, more sophisticated types of controls such as a seat and back lock.

4. Armrests

   Armrests can help relieve the strain of prolonged seated work on shoulders, back and neck. On the other hand, armrests have the potential for obstructing free movement and may not be suited for some work.

   Whether to use armrests depends on the application and user preference. Chairs of modular construction provide the flexibility to incorporate the most suitable armrest style or to add armrests in the future.

   Chairs fit many more workers and work situations when the height and width of their armrests are adjustable.

5. Casters and glides

   Casters or glides can reduce stress and fatigue when they easily move individuals as needed at their workstations. These parts need to be selected according to the application, including the type of floor surface (hard or carpeted) and requirements for resisting movement.

   Locking casters can increase safety in tasks involving machinery, cutting tools, table saws or conveyor lines, and work well on tile, wood and other hard floors. Caster options include the ability to lock when the seat is occupied, wide casters for grated floors and non-skid glides.

6. Other alternatives

   For ergonomic alternatives, look beyond traditional chairs and stools to other workplace solutions such as:

   - Sit/stands that help prevent muscle strain for workers who normally stand for much of the day.
   - Urethane ergonomic chairs that are easy to wash down and resist damage in harsh industrial settings.
   - Ergonomic welding chairs with upholstery that is fire-retardant and resistant to high heat.
   - Adjustable stools that are wall-mounted and swing out to a work position or under a conveyor to a production station.

Ergonomic seating, personalized for the application, can deliver on the bottom line in increased productivity, fewer and less traumatic injuries, fewer lost workdays, and a favorable impact on workers' compensation and medical insurance costs. The result is risk control rather than risk financing.

The Right Seat Height

Because of body differences, there is no single formula for determining the correct seat height for every individual and work situation. There is, however, a calculation that can serve as a guideline. Measure the real work level - not just the height of the work surface, but the entire distance from the floor to where the hands are performing a task. Then subtract 12 inches for the correct seat height. This height should be the midpoint of the chair's seat-height adjustment range. For example: 36-3/4" (work level from floor to task height) - 12" = 24-3/4" (midpoint of seat-height adjustment range)

Cold Weather Advice

Citation: "*Taking the Bite out of Cold Weather",* by Sandy Smith, Occupational Hazards, December 2004.

When working in severe winter conditions, sometimes you just have to say no, insists Lonnie Baldwin, director of Safety for Washington Group International's (WGI) Power division, which builds power plants around the world. "When there's a -45º Fahrenheit wind chill, then you should only do emergency work," he says. "Some days, regardless of how much work needs to be done, employees cannot be outside."

Baldwin should know: WGI – named one of America's Safest Companies in 2004 – has thousands of employees on construction projects around the world, many of them in cold climates, including that proverbial icebox, Siberia. "We have 1,000 workers building a power plant and clean air systems in Wisconsin," Baldwin adds, "and it gets pretty cold up there, too. We'll have 3,000 workers up there within the year, and cold weather safety is important."

He says WGI does so much work in both hot and cold climates that it has a policy to deal with work in temperature extremes. "We make sure employees and supervisors understand the effects cold and heat can have on them," he says. "Work in extreme temperatures can be fatal."

Baldwin compares such work to that in any other harsh environment, such as one involving chemical hazards or confined space entry. "We take readings – measure temperature and wind velocity – and decide how to proceed," he notes, adding that such precautions are really no different than monitoring for gas or vapors in a potentially dangerous work environment. And, he adds, working in extreme cold should be treated with as much caution and respect for hazards as in any other potentially fatal work environment.

Training for Supervisors and Employees

WGI supervisors and employees are educated about the impact of cold on the body and the danger signs to look for – changes in skin color, disorientation, drowsiness – when working in extreme cold. For example, a pale appearance in fingers, toes, cheeks or noses that should be rosy from the cold can be an indication of frostbite. Another symptom of frostbite is loss of feeling in extremities.

More severe reaction to cold is called hypothermia, which occurs when the body temperature drops to less than 90º Fahrenheit. Symptoms of hypothermia include uncontrollable shivering, slow speech, memory lapses, frequent stumbling, drowsiness and exhaustion.

WGI trains employees and supervisors on proper first aid for workers who show signs of frostbite or hypothermia. They are taught to move the ill worker to shelter, begin warming the person slowly and seek immediate medical assistance. The body – neck, abdomen, chest and groin – should be warmed first. Warming arms and legs first can force cold blood to circulate through the heart, which could lead to heart failure. Employees are told to give the worker warm, sweet drinks if he is conscious.

During training, employees are taught how to dress for cold weather. "They need to dress in layers. First, a layer of cotton, to wick moisture away from the body. Then wool, for its insulation properties. Then, nylon or Gore-Tex, to protect them from wind. We tell them to wear insulated head coverings, gloves and boots. On most of our jobs, we provide them with insulated gloves," says Baldwin.

Employees are counseled to avoid alcohol and smoking when in extreme cold. "It constricts blood flow to the skin, and can contribute to frostbite or hypothermia," Baldwin notes.

Offering guidance about proper clothing is only about one-third of the company's efforts to educate and protect employees working in extreme cold. As with any hazard, the company relies on engineering and administrative controls to help protect employees.

Hierarchy of Controls

As any safety manager knows, personal protective equipment is the last line of defense against a workplace hazard. Engineering and administrative controls are the preferred way to control or eliminate dangerous situations. WGI has incorporated a number of engineering controls into its cold weather work environments. Baldwin says the company uses radiant heaters to warm workers, places insulated handles on equipment and constructs shields to protect workers from wind.

Administrative controls include educating employees about proper clothing and providing them with a warm area (65º Fahrenheit) to change clothing and take breaks. Workers are told to drink plenty of liquids to avoid dehydration, which can be just as much of a danger in cold weather as in hot weather. Outside work is scheduled, whenever possible, for the warmest parts of the day.

Employees are also encouraged to take part in warm-up stretching sessions before starting their shifts, a proactive step applauded by Dr. Donald Condit, M.D., a clinical assistant professor at Michigan State University and an orthopedic surgeon in Grand Rapids, Michigan. "Workers are more likely to sustain muscle strains and sprains when they are out in the cold and haven't taken time to warm up their muscles," he points out.

Condit notes that in his practice, he sees a number of workers who have been injured by slips and falls on icy surfaces, or who have lost fingers or thumbs after sticking their hands into snowblowers they thought were turned off. "They turn off the snowblower and stick their hands in to clear heavy snow that's jammed in there. They don't realize the machine has a couple of extra rotations," he says.

He advises workers who have sustained a broken bone or suffered a strain injury to be aware that cold weather could cause additional pain or stiffness. "The stiffness goes away after about a year," he says, "but in the meantime, be aware that you will have increased sensitivity to cold."

Baldwin says WGI supports the concept of self-determination for employees working in the cold. They are encouraged to come to supervisors when they believe they are becoming too cold. The supervisors will either send that employee to another area to warm up, or call a break for all employees so that everyone can warm up. The company also utilizes a buddy system for working in temperature extremes. Employees are expected to step in if they perceive that a coworker is exhibiting symptoms of frostbite or hypothermia. "Employees are taught and told to look for symptoms of cold-related illness," says Baldwin, "and it is a supervisor's responsibility to get that person to safety, whether it's loading him into a pickup truck and taking him to a warmer area or a full-blown rescue."

The point is, says Baldwin, "Employees will do what supervisors ask them to do. That's why we have a written policy and procedures for working in the cold. If you have too many people making decisions, then employees get injured."

Written Procedure

The WGI procedure for working in extreme temperatures applies to all WGI employees and subcontractors who are involved in work environments that have the potential to cause heat- or cold-related injury or illness. Much of the information contained in the procedure was taken from the ACGIH Threshold Limit Values (TLV) for Chemical Substances and Physical Agents under the section on "Thermal Stress." The procedure outlines the duties and responsibilities for every employee involved in a project – project manager, site manager, project engineering manager, project safety manager, project radiological manager, project training coordinator, project medical consultant and WGI employees and contract employees – where extreme temperatures are a concern.

For example, the project safety manager (PSM) is responsible for providing assistance to supervisors in conducting hazard evaluations of the work environment for heat and cold stress; ensuring proper instrumentation is available to conduct the evaluation as needed; providing assistance to supervisors in recommending and implementing countermeasures, and providing hazard awareness to project personnel conducting WGI work-planning operations. The project radiological protection manager works with the PSM to provide guidance for contamination control where instrumentation is utilized for monitoring of hot and cold environments, and to provide assistance to supervisors in selection and implementation of countermeasures for hot and cold environments in radiological controlled areas. It is the responsibility of WGI employees to become familiar with heat and cold stress and their causes; to practice recommended guidelines when directed to do so by supervisors; to recognize signs and symptoms of heat and cold stress; and to inform supervisors of any physical condition that may reduce tolerance to work in extreme temperatures.

The procedure defines heat and cold stress and their symptoms, outlines physical conditions that can contribute to heat and cold stress, offers engineering and administrative controls, and provides information about wind chill and a work/warm up chart for work shifts.

The chart, which comes from the ACGIH, takes such elements as wind velocity and temperature into consideration. "For example, if there's no noticeable wind and the temperature is -25º to -29º Fahrenheit, then the maximum time spent outdoors should be 75 minutes with two breaks of 10 minutes each," says Baldwin. "If the wind is blowing at 10 mph, then the maximum work period is 40 minutes, with four, 10-minute breaks." All non-emergency work ceases if it is -45º Fahrenheit with zero wind. When the wind is blowing at 20 mph, then non-emergency work ceases when it is -25º to -29º Fahrenheit.

WGI supplies wind velocity gauges and thermometers for all projects that cannot rely on local weather reports. "It's part of the essential equipment they need to do the job," says Baldwin.

Having a written procedure is important, he adds, "because you can't make good decisions based on personal opinion. We rely on the employees to tell us when they're getting too cold, but other than that, there is a science to this and we use it to ensure employees are not injured."

"Working in extreme cold and heat are just as dangerous as any other work hazard, and we treat them that way," Baldwin notes.

More Cold Weather Advice – Winter Driving

Citation: *"Taking the Bite out of Cold Weather",* by Sandy Smith, Occupational Hazards, December 2004.

Employee Safety Primer: Winter Driving

The leading cause of death during winter storms is transportation accidents. Preparing vehicles for winter weather and training employees to know how to react if stranded or lost on the road are the keys to safe winter driving, says the Minnesota/Iowa AAA.

Before Driving

"Millions of vehicles in this country are in need of preventive maintenance before the weather turns colder," says Jeff Ogden, AAA Minnesota/Iowa president. "Having an inspection conducted by a qualified technician can catch those services that can be done now, instead of being faced with a bigger, more expensive problem later."

- Have a mechanic check the battery, antifreeze, wipers and windshield washer fluid, ignition system, thermostat, lights, flashing hazard lights, exhaust system, heater, brakes, defroster and oil level (if necessary, replace existing oil with a winter grade oil or the SAE 10w/30 weight variety).
- Install good winter tires and make sure the tires have adequate tread. In many states, all-weather radials are adequate for most winter road conditions. Some jurisdictions do require that vehicles must be equipped with chains or snow tires with studs, so contact your local state police to determine what is required in your area.
- Keep a snow scraper and small broom in the vehicle for ice and snow removal.
- Try to maintain at least a half tank of gas during winter months.
- Listen to weather reports for the latest road conditions. Travel during daylight, if possible. When driving in severe winter weather conditions is unavoidable, try to send at least two people.
- Dress warmly. Wear layers of loose-fitting, layered, lightweight clothing.
- Carry food and water. Store a supply of high-energy snacks such as canned nuts and several bottles of water.
- Carry flashlights with extra batteries, a first aid kit with a pocketknife, any vital medications, blankets, matches, extra clothing (mittens, socks, hats, rain gear) and a brightly colored piece of cloth to use as a flag.
- Carry sand or kitty litter for generating traction under wheels and keep a small shovel, tools and booster cables in the car.

While Driving

When driving during slippery and icy conditions, slow down and keep a safe distance from other vehicles, minimize brake use and remember that traction is greatest just before the wheels spin. Gentle pressure on the accelerator pedal when starting is the

best method for retaining traction and avoiding skids. The most effective way to stop on ice and snow is to apply brakes gently. With an antilock braking system (ABS), a vibration or pulsation will be felt in the brake pedal when coming to a stop. This means the system is operating as designed to prevent wheel lock up. Do not pump your brakes if your car has ABS.

In addition, advise employees to keep seatbelts fastened and make certain that all passengers are securely restrained. When driving in falling snow or fog, lower speed, use low-beam headlights or fog lights, and keep a safe distance from the vehicle in front.

Trouble on the Road

Advise employees that if they get caught in a blizzard, they should stay in the car. They should not leave the car to search for assistance unless help is visible within 100 yards. They may become disoriented and lost in blowing and drifting snow.

They should display a trouble sign, such as a brightly colored cloth on the radio antenna, and raise the hood of the car.

Employees should be told to occasionally run engine to keep warm. To do this, they should turn on the car's engine for about 10 minutes each hour and run the heater while the car is running. Also, they should turn on the car's dome light when the car is running.

Caution employees to be aware of carbon monoxide poisoning. They must keep the exhaust pipe clear of snow, and open a downwind window slightly for ventilation.

They should watch for signs of frostbite and hypothermia and do minor exercises to keep up circulation. These exercises can include clapping their hands and moving their arms and legs occasionally. They should try not to stay in one position too long, but must be careful to avoid overexertion, because cold weather puts an added strain on the heart.

If more than one person is in the car, they should huddle together for warmth and take turns sleeping.

Cold Weather and Cardiovascular Disease

Citation: *"Taking the Bite out of Cold Weather",* by Sandy Smith, Occupational Hazards, December 2004.

Cardiologist Dr. Richard Stein has a word of caution about winter: it can be very hard on your heart. According to Stein, who serves as a spokesman for the American Heart Association (AHA), people tend to do substantially more work in the winter than they are accustomed to doing in warmer months, and that can prove deadly. "In the summer, it's hot and we know not to get dehydrated or too warm. In the winter, since it's not hot, we don't realize how hard we're working when we're outdoors," he notes.

He recommends that people who are outdoors in cold weather avoid sudden exertion, like lifting a heavy shovel full of snow, unless they are accustomed to physical labor.

Even walking through heavy, wet snow or snowdrifts can strain the heart. "If you are not used to exercising during the rest of the year, then certainly, in cold weather, do not increase your workload outside," he counsels. In addition to the extra exertion placing a strain on the heart, the heart must work harder to circulate blood in cold weather, Stein says.

And, he adds, inhaling cold air can temporarily narrow arteries, causing a short-term slow-down in blood flow to the heart. "We're not certain why, but seasonally, it's more common to have a heart attack in winter months than during summer months," says Stein. "It's true whether you live in Arizona or Minnesota."

According to AHA, employees with heart disease are at special risk. As people age, their ability to maintain a normal internal body temperature often decreases. Because older people seem to be relatively insensitive to moderately cold conditions, they can suffer hypothermia without knowing they're in danger.

People with coronary heart disease often suffer chest pain or discomfort called angina pectoris when they're in cold weather. Besides cold temperatures, high winds, snow and rain also can steal body heat, the AHA counsels. Wind is especially dangerous, because it removes the layer of heated air from around the body. At 30º Fahrenheit in a 20-mile-per-hour wind, the cooling effect is equal to calm air at 4º Fahrenheit. Similarly, dampness causes the body to lose heat faster than it would at the same temperature in drier conditions.

Stein suggests employees dress for the weather, wear a scarf or face mask to create a buffer zone between frigid air and the lungs, and refrain from undertaking more strenuous activities in the winter than they would do in the summer.

Lead Exposure Link to Cataracts

BCC News reported that accumulated lead exposure may increase the risk of developing a cataract. Scientists found people with the highest level of lead in their bones were most likely to develop a cataract. Despite measures to cut lead pollution, most adults have substantial levels in their bodies. The researchers investigated whether there was an association between the development of cataracts and lead levels in two bones - the tibia (shin bone) and the patella (kneecap). The researchers found that men with the highest tibia lead level were 2.7 times more likely to develop a cataract than those who recorded the lowest level of lead in this bone. When other factors, such as smoking and diabetes were taken into consideration, the risk rose to 3.2 times that of those exposed to the lowest lead levels. View the BBC article at http://news.bbc.co.uk/2/hi/health/4073259.stm. (CHPPM HIO Weekly Update – December 10, 2004)

AEterna Gets Nod for Fever Drug

The Globe and Mail reported that AEterna Zentaris Inc. of Quebec City has won approval to market in Germany its drug for black fever and to distribute it to German troops infected while serving in Afghanistan and Iraq. The Canadian biotech company said the German Food and Drug Agency has approved miltefosine, or Impavido, which

has a cure rate of 95 percent for leishmaniasis, the scientific name for black fever. The German government agency also awarded the company a Free Sales Certificate, which paves the way for registration in countries such as Colombia and Pakistan where the parasitic disease is endemic. The infection is a growing problem in Europe, particularly with patients infected with HIV or AIDS. (CHPPM HIO Weekly Update – December 17, 2004)

New Drug Cuts Tuberculosis Treatment Time in Half

Health Talk reported that a new drug may revolutionize the way tuberculosis is treated around the world. Researchers identified a novel antibiotic that works better and faster in treating TB infection than current standard treatment options. A compound called R207910 cut treatment time by 50 percent in mouse models. Preliminary studies on human volunteers show the drug is safe, according to the researchers. R207910, belongs to a new family of anti-TB agents called diarylquinolines (DARQ) and worked better at clearing infection from the lungs of mice than the triple cocktail regimen currently recommended by the World Health Organization (WHO). Each year about nine million new cases of TB occur around the world and 2 million people die every year from the infection. Experts believe R207910 could become the first new drug in 40 years to combat the deadly disease. View the Health Talk article at http://www.healthtalk.ca/tb_treatment_12122004_7899.php . (CHPPM HIO Weekly Update – December 17, 2004)

Talking and Driving Don't Mix

Citation: "*Talking and Driving Don't Mix*," by J. Croasmun, *Ergoweb*, December 2004, http://www.ergoweb.com/news/detail.cfm?id=1027.

Young or old, seasoned driver or newbie, a recent set of studies says that if you're talking while driving, you're probably not paying attention. A pair of experiments published in the journal Human Factors, Fall 2004, sought to determine how conversing while driving affected attentiveness for young and old drivers, and if merely listening to a conversation rather than participating in one could also play a role in driver distraction.

Starting with a group of 14 younger drivers with an average age of 21 and at least one year of driving experience, and 14 older drivers with an average age of 68, researchers reviewed response time of the subjects as each subject carried on a conversation while watching a windshield-size screen showing a Chicago traffic scene. Subjects were asked to press a button any time they noticed a change in the scene.

What researchers found was that young drivers reacted more slowly, or missed altogether, the scene's crucial changes when they talked; older drivers detected the crucial changes, but no more quickly than they saw scene changes, like billboards, that had no safety impact.

Yet, in comparison, researchers also found that when the subjects merely listened to a conversation, regardless of age, they were able to react as quickly to the scene's changes as they were able to do when there was no conversation at all.

According to researcher Arthur F. Kramer from the University of Illinois at Urbana-Champaign, these results don't bode well for users of hands-free cell phones. "Should you talk on a hands-free cell phone when driving? No. It's a risk," he told Reuters Health, stressing the importance of reaction time while driving. "Several seconds can be a lot when you're driving."

The next step, Kramer said, will be to determine if talking to car passengers can affect the driver's attentiveness. Some proponents of hands-free devices have already said that banning hands-free options due to their distractive qualities - drivers can only concentrate on so many things at once; when a driver uses a cell phone with or without hands while driving, some aspect of concentration will naturally give - should translate into banning passengers from cars as well.

Vaccinating Mice Could Reduce Lyme Disease

Reuters reported that vaccinating mice against Lyme disease may help protect people against the infection, which is often spread from mice to humans. The study is one of the first to show that immunizing a wild animal that carries a disease might serve to protect humans, the National Institute of Allergy and Infectious Diseases said. "When integrated with other protective measures, this strategy could have significant implications, not only for preventing Lyme disease, but for preventing other vector-borne diseases as well, including plague and West Nile virus," said NIAID head Dr. Anthony Fauci. Lyme disease passes from mice and other small rodents to people via blackfooted ticks. Often deer are involved. It would be necessary to develop a vaccine that could be given orally, probably in mouse bait, the researchers said. For their study, the team at Yale University and elsewhere caught 1,000 white-footed mice, drew their blood, examined the ticks in their fur and then vaccinated half of them. When an infected tick nymph feeds on an immunized mouse, the mouse's immune system kills the bacteria inside the nymph. After vaccinating the mice, the researchers found 55 percent fewer tick nymphs were infected.

Youki Spray Curbs Spread Of Superbug MRSA

EurekAlert reported that in wound care treatment, a spray called Youki that accelerates the healing process. The wound care system developed to avoid the need to cover up open injuries with bandages is proving successful in preventing, treating and halting the spread of superbug MRSA bacterium (methicillin resistant *Staphylococcus aureus*). Research Director Sujata Jolly from UK laboratory Depeche Mode said, "If you cover a wound week after week then the skin is going to get soggy and it's going to break down. This residue sits on the wound and it's highly alkaline. The wound just gets bigger." Depeche Mode's system is a spray that encourages the skin to heal itself naturally by creating an invisible web across the wound. Amino acids and proteins that mimic those made by blood, rapidly speed up the cell growth to fill any holes. It basically speeds and assists the scabbing process. Wounds are only washed once, at the start of the healing process, then not allowed to get wet at all. "You need to spray several times to build up a protective film," says Jolly. She says that by not changing dressings you're not disturbing the wound and Youki accelerates the healing process

and minimizes scarring. View the EurekAlert article at http://www.eurekalert.org/pub_releases/2004-12/bis-ysc121704.php. (CHPPM HIO Weekly Update – December 23, 2004)

Laptop Computers and Male Health

Citation: "*Finally an Answer to That Burning Laptop Question...*," by J. Croasmun, *Ergoweb*, December 2004, http://www.ergoweb.com/news/detail.cfm?id=1032.

If you're a male who uses a portable computer literally as a laptop computer, researchers indicate you may want to think about getting a desk instead. A new study by the State University of New York at Stony Brook finds that the high internal operating temperatures in laptop computers can equal excessive heat transferred to the scrotum and ultimately affect the quality and quantity of the computer user's sperm.

"The increase in scrotal temperature is significant enough to cause changes in sperm parameters," Dr. Yefim Sheynkin, an associate professor of urology at SUNY-Stony Brook told Reuters. "It is very difficult to predict how long the computer can be used safely. It may not be at all, if the testicular temperature goes up high within a very short period of time."

Particularly at risk, says Sheynkin, are younger men, especially if they use a laptop computer several times a day over the course of time. "Long-term use may have a detrimental effect on their reproductive health," he said.

To arrive at these conclusions, Sheynkin recruited 29 healthy volunteers between the ages of 21 and 35 to determine what kind of effect using a laptop computer had on scrotal temperature. The volunteers' scrotal temperatures rose over two degrees centigrade when the laptop computers were merely placed on the volunteers' laps. Once the laptop computers were turned on, the scrotal temperatures increased by 2.6 degrees C on the left side and 2.8 degrees C on the right side.

These results indicate that it's not just a matter of a warm computer, but also the fact that a laptop computer positioned directly on the user's legs causes body heat to build up beneath the computer.

In addition to excessive heat, laptop computers are also infamous for their poor ergonomics and the injury risk potentials associated with small keyboards, awkward positioning of the user in relationship to the attached screen and keyboard, and the laptop's heavy carry-on load.

Indian Ocean Earthquake & Tsunami Emergency Update

The Pacific Disaster Management Information Network reported that search and rescue operations for the December 26th's massive tsunamis are largely over. The tsunamis were triggered by an undersea earthquake measuring 9.0 on the Richter scale off the west coast of Indonesia's northern Sumatra Island and killed more than 150,000 people along the coastal areas of some 11 countries in the Indian Ocean. The focus of attention is now quickly shifting to relief and recovery efforts. Tsunami-related deaths have been reported in Sri Lanka, India, Indonesia, Thailand, Malaysia, Myanmar,

Maldives, Bangladesh, Somalia, Tanzania and Kenya. The loss of life has been particularly severe in Indonesia, Sri Lanka, India and Thailand. According to the Indonesian Health Ministry, the death toll has now climbed to over 94,081, with the possibility of 100,000 or even more in the northern province of Aceh on the island of Sumatra and along the 115 miles of the islands along Indonesia's northwestern coast, which is close to the epicenter of the earthquake. WHO estimates 80 percent of Aceh's west coast has been damaged. The death toll in Sri Lanka and India has also climbed to in excess of 30,000 and 9,400 deaths respectively. India's Andaman and Nicobar Islands, as well as the southern state of Tamil Nadu, have been the worst hit areas. The death toll in Thailand's resort islands of Phuket and Phi Phi has now climbed to over 5,000, including some 2,500 foreigners from at least 36 countries. More than 400 combined deaths have also been reported in Malaysia, Myanmar, Bangladesh, Maldives, Somalia, Tanzania and Kenya. UNICEF officials say the health situation in India's worst-hit district of Nagapattinam in the southern state of Tamil Nadu is "decent." An adequate supply of clean drinking water has prevented the outbreak of an epidemic. View the CDEM&HA updates at http://coe-dmha.org/Tsunami/Tsu010505.htm. (CHPPM HIO Weekly Update – January 7, 2005)

INTERNET NEWS

Web Page Focuses on Teen Worker Safety

A new web page is up and running to provide employers and teen workers with valuable safety and health materials on working safely during the winter months. "Winter Worker Land" is the latest product from the Federal Network for Young Worker Safety and Health (FedNet), a group of 11 federal agencies that together educate teens, parents, counselors and employers on how young people can stay safe on the job. The new webpage covers safe winter driving, snow removal, cold weather gear, and offers other winter safety tips. Find the new page at http://www.osha.gov/SLTC/youth/winterjobs/.

INDUSTRIAL HYGIENE PROFESSIONAL NEWS

AIHA Issues List of Top Public Policy Issues

The American Industrial Hygiene Association (AIHA), as a result of its biannual membership survey, projects the top public policy issues of concern to AIHA members and the occupational and environmental health and safety (OEHS) profession over the next two years.

AIHA has identified the following as the top public policy issues for 2005-2006:

Regulatory Issues

- Permissible Exposure Limits (PELs)

The Occupational Safety and Health Administration (OSHA) PELs are consensus-based limits that indicate how long an individual can be exposed to a particular substance without experiencing harmful effects. The occupational health and safety profession considers PELs to be one of the most basic tools needed to protect workers. However, many PELs have not been updated since the 1970s. Science in this area has matured, but the PELs have not. AIHA continues to facilitate a working group of industry and labor professionals striving to reach a consensus on the best way to update the PELs. The group continues to consider ways that regulatory or legislative changes could improve current methods.

- Emergency Preparedness and Response

  Homeland security is as vast as the transportation system and is as personal as the individual workers who need protection. OEHS professionals are crucial to the safety of emergency response workers and the community that depends on them. AIHA began its efforts on this issue following the September 11th attacks and continues to move forward to provide assistance regarding emergency response issues. In addition to internal association efforts to build programs to supplement federal homeland security efforts, AIHA hopes to work with other organizations to develop programs that address the important issues in emergency preparedness and response.

- Safety and Health Programs

  Notwithstanding the fact that this issue has been removed from the OSHA regulatory agenda, AIHA fully supports efforts to ensure that employers incorporate a written safety and health program into workplace policies.

- Ergonomics

  AIHA remains convinced of the need for an ergonomics standard, yet in the absence of a standard supports OSHA's development and release of voluntary industry-specific guidelines. In addition to the considerable information available on AIHA's website, the AIHA/OSHA alliance focuses most of its efforts on ergonomics issues.

- Hazard Communication/Material Safety Data Sheets (MSDSs)

  Because of increased interest in hazardous materials over the past several years, AIHA and its members have had success in also bringing hazard communication and MSDSs to the forefront. AIHA supports efforts to improve the accuracy of MSDSs and supports efforts to improve hazard communication for employers and employees. Such efforts are also a crucial element in protecting workers and others in case of national emergencies.

Legislative Issues

- OSHA, NIOSH, EPA Appropriations

  Protection of workers and research and education efforts in support of worker health and safety are not possible without adequate federal resources dedicated to the issue. While OSHA and NIOSH have fared reasonably well over the past several

years, continued concern over the federal budget deficit could create the need to reduce expenditures in this area. AIHA believes that OSHA and NIOSH must remain adequately funded to carry out their statutory responsibility to ensure that every worker who goes to work returns home safe and healthy. AIHA also supports adequate funding for the Environmental Protection Agency.

- Emergency Preparedness and Response

  Similar to AIHA's concern for this issue from a regulatory perspective, AIHA supports legislative measures that further incorporate programs for emergency preparedness and response. AIHA believes that both federal and state legislation is needed to clearly define the kind of programs needed and the resources to put these programs in place.

- Professional Recognition/Title Protection

  This issue continues to appear in the top public policy issues for AIHA, as it has since 1993. Professional recognition/title protection allows industrial hygienists and others who have met minimum educational and experience requirements (such as certified industrial hygienists and certified safety professionals) to be legally defined and recognized as competent to perform certain work without the need for additional requirements. While some form of professional recognition/title protection legislation has been enacted in 18 states, AIHA continues to educate federal and state policymakers about the importance of recognizing those professionals who have received education and certification from nationally recognized and accredited organizations.

- Laboratory Accreditation

  Accredited laboratories are the best way to ensure that test samples from workplaces, homes, and food facilities are analyzed correctly. Over the course of the last several years, AIHA has been working to see that the AIHA laboratory accreditation program is noted in federal and state legislation and regulation as one of the programs with national recognition and acceptance. This issue continues to be an important part of both scientific and government affairs around the country.

- OSHA Reform – Compliance Assistance, Third Party Review, Professional Certification, Federal Contracting/OSHA Compliance, Voluntary Protection Program, Criminal Penalties

  Congress is likely to consider several measures that would reform a number of OSHA policies. As was the case in the 108th Congress, AIHA will continue to make recommendations and monitor any potential changes at OSHA that may impact occupational health and safety and workers.

- Material Safety Data Sheets

  Over the course of the past year, there has been increased attention given to MSDSs and their importance in protecting workers from hazardous materials. Much of this increased attention is due to international acceptance of the Globally

Harmonized System (GHS). AIHA supports efforts to improve the training provided to employers and employees in developing and interpreting MSDSs, improve the accuracy of MSDSs, and work with Congress and others to determine whether, and how, the United States should address the issue of the GHS.

Other issues AIHA members find most important are personal protective equipment, generic exposure assessment regulations, and risk assessment legislation. AIHA makes these issues a priority within its government affairs efforts and strives to keep occupational health and safety in the forefront with federal and state policymakers.

JUST THE FACTS

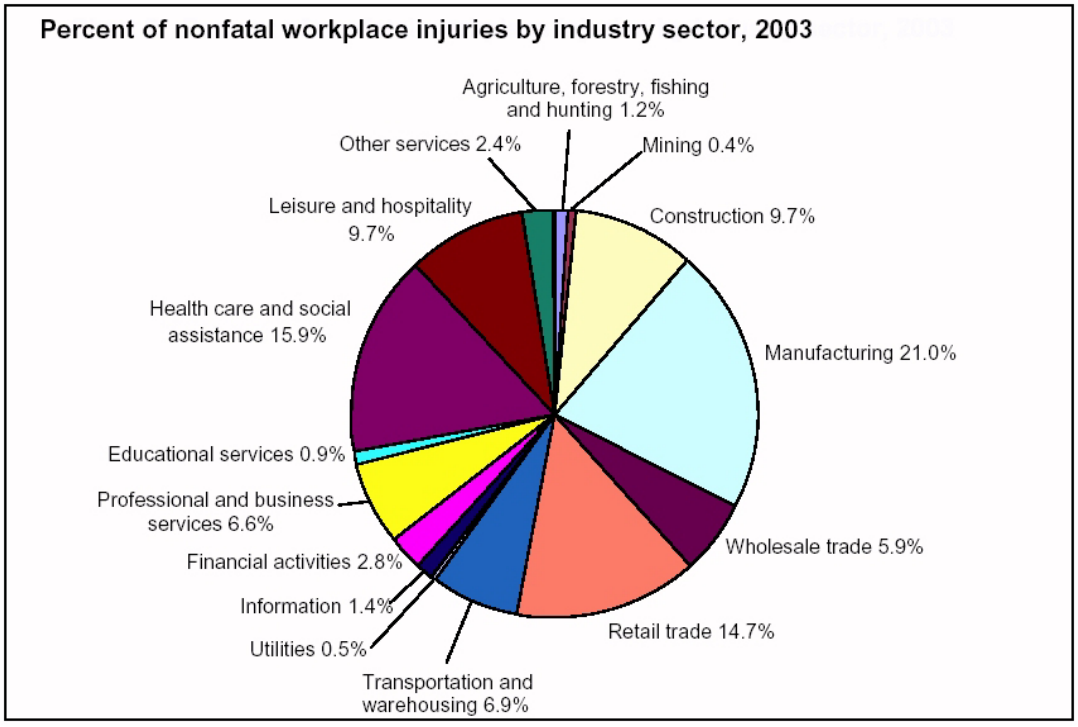
BLS Reports Decline in Workplace Injury and Illness Rates for 2003

Approximately 4.4 million injuries and illnesses were reported in private industry workplaces during 2003, according to the latest report by the Labor Department's Bureau of Labor Statistics. The number translates to a rate of 5.0 cases per 100 full-time workers and a 7.1 percent decrease in the actual number of injuries and illnesses reported in 2002. Find the report at http://www.bls.gov/news.release/pdf/osh.pdf.

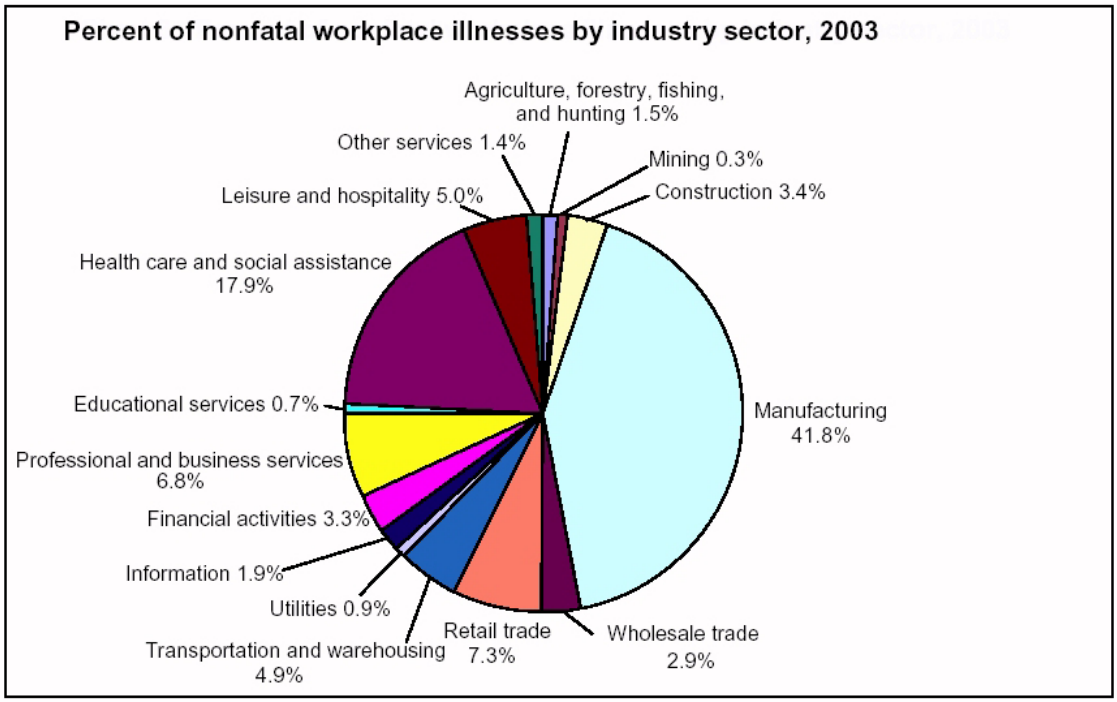
Goods producing industries as a whole had a rate of 6.7 cases per 100 equivalent full-time workers while service providing industries as a whole had a rate of 4.4 cases per 100 equivalent full-time workers. Among the goods producing industry sectors, incidence rates during 2003 ranged from 3.3 cases per 100 full-time workers in mining to 6.8 cases per 100 full-time workers in manufacturing and construction.

For private industry in 2003, rates for injuries and illnesses ranged from 2.0 cases per 100 workers for small establishments (those employing 1 to 10 workers) to 6.2 for mid-size establishments (those employing 50 to 249 workers).

Of the 4.4 million nonfatal occupational injuries and illnesses in 2003, 4.1 million were injuries. Of these 4.1 million injuries, 1.3 million or 32 percent occurred in the goods producing industries while 2.8 million or 68 percent occurred in the service providing industries. Goods producing industries employed 21.5 percent of the private sector workforce covered by this program while service providing industries employed 78.5 percent of the workforce. The manufacturing sector and the trade sectors had the largest shares of injury cases with 21 percent each, followed by the health care and social assistance sector with 16 percent. (See chart below.)



There were about 269,500 newly reported cases of occupational illnesses in private industry in 2003. Service providing industries accounted for 53 percent of these cases while goods producing industries accounted for 47 percent. The manufacturing sector accounted for 42 percent of all newly reported cases of occupational illnesses. (See chart below.) The "All other illnesses" category accounted for over 75 percent of total illness cases in 2003. Over 48 percent of all other illness cases were in manufacturing industries.



PUBLICATIONS

ASHRAE Publishes 2004 Residential IAQ Standard

Standard 62.2-2004, which contains the first changes resulting from continuing maintenance proposals from the public, has been published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Additionally, the American National Standards Institute (ANSI) Board of Standards Review recently denied appeal of the standard, thereby upholding its earlier approval.

ANSI/ASHRAE Standard 62.2-2004, Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings, is the only nationally recognized indoor air quality standard developed solely for residences. The 2004 standard contains changes made via two addenda, which are the first changes resulting from continuing maintenance proposals from the public.

The standard no longer contains combustion appliance back-drafting test requirements. The test included in the 2003 standard was based on the best industry-accepted method found in the National Fuel Gas Code but questions arose about its application to solid-fuel burning appliances, according to David Grimsrud, chair of the committee that wrote the standard. There also was concern about it not being possible to perform the test until the home is completed, opening the potential for having to perform remedial balancing at a difficult stage of construction and sale, he said. While the test requirements have been eliminated, the standard sets an upper limit of exhaust flow to 15 cfm/100 square feet when natural-draft combustion appliances are present.

The standard also contains a change in climate zone terminology from "severe cold climate" to "very cold." This makes the standard's climate definitions consistent with proposed revisions to the International Code Council climate zone definitions, which will simplify implementation of Standard 62.2 into code, said Grimsrud. ASHRAE has proposed that the standard be included in the 2006 International Residential Code.

ASHRAE Standard 62.2-2004 is available through ASHRAE Customer Service or their web site at http://www.ashrae.org/.

ASHRAE Publishes 2004 Residential Energy Standard

By reducing the number of tables needed to apply the envelope provisions and simplifying their application, ASHRAE's residential energy standard now contains only the essential information necessary to design and enforce energy conservation requirements. ANSI/ASHRAE Standard 90.2-2004, *Energy-Efficient Design of Low-Rise Residential Buildings*, provides minimum requirements for the energy-efficient design of residential buildings.

"Those who use energy codes that govern one- and two-family dwellings and low-rise multifamily structures indicated that they needed a standard that was simpler and less design intensive, Steve Skalko, chair of the committee that wrote the standard, said. "Standard 90.2-2004 represents a major overhaul in formatting and improvements in energy conservation provisions." More than 45 figures and tables regarding thermal envelope provisions were replaced with two tables.

Also, a new normative appendix has been added that allows users to comply with the prescriptive envelope provisions by applying an envelope trade-off procedure as an alternative. It provides the same flexibility that was previously covered by the existing envelope trade-off procedure but with simpler format and easier application, according to Skalko. The third envelope compliance path, the annual energy cost method that was included in the 2001 standard, has also been maintained.

Existing climate tables were deleted and replaced with a new map and tables of the United States that illustrate the eight primary zones considered representative of climate zones most applicable for current-day energy standards. The section was also expanded to include international data. The new map and tables are based on material developed by the U.S. Department of Energy and is being incorporated into other national energy standards and codes. The climate data section also was expanded to include international data.

Other changes include:

- Provisions to permit slab edge insulation to be omitted in areas of the United States where termite infestation is known to be heavy. Experience has shown that insulation materials placed at the outside edge of slabs that come in contact with the ground provide a means for termites to infest the buildings by burrowing into or behind the insulation and into the building without a readily visible means of detecting their presence. Energy savings were often offset by increased costs for structural repair of damage caused by the termites, according to Skalko.

- Provisions to permit users to consider the use of high-albedo roofs in hot and hot-humid climates in order to reduce air-conditioning energy use. The installation of these reflective roofs permits users to modify the thermal transmittance of the ceilings as a credit for their use.
- Removal of provisions for manufactured housing. Energy conservation for these types of residential dwellings is already covered by federal requirements, which preempt energy codes and standards such as 90.2.

ANSI/ASHRAE Standard 90.2-2004 is available through ASHRAE Customer Service or their web site at http://www.ashrae.org/.

NIOSH Issues Guide to Selecting Non-Powered Hand Tools

The NIOSH teamed up with Cal/OSHA Consultation Service to develop its new guide regarding selecting and evaluating the ergonomic benefits of non-powered hand tools. The guide, "*Easy Ergonomics: A Guide to Selecting Non-Powered Hand Tools*," offers tips, guidance and a checklists to help users select tools that can help reduce or limit the risk of work-related injuries like musculoskeletal disorders (MSDs). Through a step-by-step approach, NIOSH's new guide gives tips for making tool evaluations covering topics like knowing the job and the workspace, how tools can affect posture, and specifics regarding tool selection including identifying tools that can be used effectively with less force, less repeated movements and less awkward body positions.

Find this guide at http://www.cdc.gov/niosh/docs/2004-164/.

NIOSH Posts 2004 "Worker Health Chartbook"

NIOSH has posted a 356-page book, "Worker Health Chartbook 2004," which covers fatal and nonfatal injuries. Although the book is dated September 2004, most of the tables include data from 2001. The preface by NIOSH chief, Dr. John Howard, indicates this is the second edition of the NIOSH chartbook; they issued the first edition in 2000.

To access the information, go to http://www.cdc.gov/niosh/docs/chartbook/

ARMY ITEMS OF INTEREST

Tsunami Relief Effort Resources

USA CHPPM has placed links to pertinent information about the Indian Ocean area on their web site to assist in preparing for deployment. This includes Medical Threat Briefings, Staying Healthy Guides for the area, mortuary information, satellite imagery, and environmental resources. Find this resource page at http://chppm-www.apgea.army.mil/documents/TsunamiReliefEffortPage10Jan05.doc.

DOD Asks to Resume Anthrax Vaccinations

The New York Times reported that the Pentagon is seeking special authority to resume administering the anthrax vaccine to military personnel, contending that troops in South Korea and the Middle East are at particular risk of being exposed to the bacteria.

Deputy Defense Secretary Paul D. Wolfowitz requested that military officials have access to the vaccine in a letter to Tommy G. Thompson, the secretary of health and human services. "There is a significant potential for a military emergency involving a heightened risk to United States military forces of attack with anthrax," Mr. Wolfowitz wrote. He cited a classified intelligence assessment from last month to support his concern, adding that it was the basis for continuing to vaccinate troops serving in South Korea and the Middle East. (CHPPM HIO Weekly Update – December 23, 2004)

Acinetobacter Infection Resources

As reported in this summary and the MMWR Weekly report in November, "*Acinetobacter baumannii* Infections Among Patients at Military Medical Facilities", there have been *A. baumannii* infections noted in casualties from Iraq and Afghanistan. The USA CHPPM has posted a link to an information sheet, *Information for Servicemembers and their Families* to pass along key facts:

- *Acinetobacter* bacteria are common in the environment but are rarely a medical threat to healthy, uninjured persons.
- *Acinetobacter* can be acquired by person-to-person contact, through contact with contaminated surfaces, or as a result of wounds contaminated with dirt and debris.
- Some types of *Acinetobacter* are resistant to antibiotics and can be severe and especially difficult to treat if they result in bloodstream infections.
- Persons most at risk of difficult-to-treat *Acinetobacter* infections are those who are very ill, have traumatic wounds, and are treated in intensive care units.
- Frequent hand washing and disinfection of medical treatment facilities are the best ways to avoid spreading *Acinetobacter*.

View the document at
http://www.pdhealth.mil/downloads/Acinetobacter_FS_120804.pdf.

ADMINISTRATIVE INFORMATION

This document was prepared for the U. S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), Directorate of Occupational Health Sciences. The POC at the USACHPPM is Sandy Monk; Program Manager; Industrial Hygiene Management Program; DSN: 584-2439; COM: 410.436.2439; e-mail: Sandra.Monk@apg.amedd.army.mil.

This document summarizes information and regulatory actions that are relevant for Army Industrial Hygiene Program personnel. We distribute this summary in electronic form only. Please make it available to your staff if they do not have direct access to an electronic copy. If you would like to be added to the electronic mailing list or if your email address changes, please contact Sandy Monk, e-mail: Sandra.Monk@apg.amedd.army.mil; or call her at DSN: 584-2439; COM: 410.436.2439; fax: 410.436.8795.

At a minimum; we review the following publications in preparing this summary: Journal of Occupational and Environmental Hygiene; the Synergist; Today (ACGIH's Newsletter); The ABIH News; OSHA Week; the Federal Register; BNA OSHA Reporter; The Journal of Occupational and Environmental Medicine; The Journal of Environmental Health; Professional Safety; Occupational Hazards; Occupational Health and Safety; and Industrial Safety and Hygiene News. We also gather information from a variety of sources on the Internet.

If you have questions or comments; please contact Dean Taiani at dtaiani@lmi.org; 410-273-2605 or fax 410-273-7587.